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ABSTRACT

Four hypotheses derived from the social facilitation model (Cottrell, 1972) were applied to black faculty productivity, using data from a survey of 386 black faculty in predominantly white universities in the Northeast. In this model, the presence of an audience or coactors is considered to be a source of arousal that can either enhance or impair performance depending on the performer's evaluation apprehension and the task being performed. The hypotheses are as follows: (1) the greater the amount of contact with whites, the greater will be the facilitation effect; (2) social facilitation will enhance performance at higher academic rank and impair performances at lower academic ranks; (3) as academic rank increases, social facilitation effects will increase; and (4) social facilitation effects will not occur as a function of contact with blacks. It was found that as the amount of contact with whites increased, the productivity of black full and assistant professors (but not associate professors) was affected, but only if the black faculty could be provided a positive or negative outcome. In addition, contact with blacks did not affect productivity, which suggests that the black audience had less evaluative potential. (SW)

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A SOCIAL FACILITATION MODEL OF BLACK FACULTY PRODUCTIVITY

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Social Facilitation Model

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ABSTRACT

In a model first proposed by Kanter and later empirically tested by Oswald, Spangler, and Pipkin, it was argued that minorities are subject to isolation and other pressures that lead them to either underachieve or overachieve. Although anecdotal evidence suggests that the Kanter argument is correct, it provides no explanation of why minority status should produce both over- and underachievement. However, a social facilitation model proposed by Cottrell does provide such an explanation. Using data from a survey of 386 black faculty in the Northeast, four hypotheses derived from the social facilitation model were applied to black faculty productivity. The results indicate that the social facilitation model does explain how minority status can affect minority achievement.

The recent reversal of the trend toward an increase in the number of black faculty in predominantly white schools (Wideman, 1978), has led to consideration of the possibility that black faculty face some form of racial antipathy (Middleton, 1978). While this possibility cannot be completely discounted, a second possibility is that black faculty encounter conditions in predominantly white institutions that adversely affect their productivity. Although consideration has been given to the possibility that various institutional arrangements may have an unintentional adverse effect on black faculty (e.g., service on academic committees), little consideration has been given to the processes by which minority status can produce pressures that affect minority performance.

Kanter (1977) predicts that females in situations with extreme minority status (i.e., less than 16 percent) will face performance pressures and either overachieve or underachieve.

Spangler, Gordon, and Pipkin (1978), in an empirical test of Kanter's hypothesis, found that women with minority status relative to the number of men do not perform as well in law school as women in law school who are not as extreme a minority, relative to the number of men. However, the process by which minority status affects performance was not explicated, with the result that the conditions leading to overachievement rather than underachievement could not be specified.

A second problem with the Kanter hypothesis and with its empirical test by Spangler et al. is that the boundary conditions within which minority status operates was not specified. Thus,

it is not clear if extreme minority status in a law school and the university of which it is a part affects performance in the same way as extreme minority status in a law school with more nearly equal percentages in the university of which it is a part.

And, a third problem with the Kanter hypothesis is that it fails to completely specify the relationship between social isolation, performance, and minority status. According to Kanter, both isolation and impaired performance result from minority status. But, it is not clear how these factors are interrelated. As conceptualized by Spangler et al., impaired performance and isolation are both indicators or aspects of the "problems" minority status can engender. However, if minority status is operationally defined as the reaction of the majority to some status characteristic held by 15 percent of those who have that status characteristic,[1] then the hypothesis is untestable. That is, if 15 percent of a group of white males have brown eyes and 85 percent of the same group have blue eyes, then the "brown-eyes" have minority status only if the majority react in ways that foster isolation and impaired performance. If the "blue-eyes" do not react in such ways to the "brown-eyes," then the "brown-eyes" do not have minority status. Thus, the majority not only "causes" minority status but also "causes" the majority to react in ways that produce minority isolation and impaired performance.

Alternatively, if isolation and impaired performance are part of a causal sequence rather than indicators of such a sequence, it is necessary to specify their place in the sequence. First, it is possible that minority status leads to impaired

performance and that impaired performance leads to isolation. As the literature indicates, such a sequence is possible, but in so far as race or minority relations are concerned, uninteresting. Violations of a group's norms, including those related to performance, will lead to the isolation of the deviate irrespective of race (Shaw, 1976).

A second possible sequence is that minority status leads to isolation and isolation in turn leads to impaired performance. Riordan and Ruggiero (1980) and Cohen and Roper (1972) have found that blacks in interracial groups are "disabled" in group interaction unless they are "treated" prior to the group interactions. Thus, if the relevant performance requires interaction, then impaired performances will be likely to result.

However, to the extent that the performance does not require interaction or may be performed in isolation, then it is not clear by what process isolation should lead to impaired performance. One model that does specify the process by which isolation may affect performance, either positively or negatively, as well as suggest the boundaries within which minority status operates is Cottrell's (1972) model of social facilitation.

In this model the presence of an audience or coactors is considered to be a source of arousal that can either enhance or impair performance. Whether enhancement or impairment occurs is considered to result from the performer's evaluation apprehension and the task being performed. If the performer

expects the audience or coactors to provide positive or negative outcomes and if the task is simple or involves a response that the performer has learned well, enhancement occurs (Cottrell, Wack, Sekerak, and Rittle, 1968; Martens and Landers, 1972). On the other hand, if the audience or coactors are not expected to provide positive or negative outcomes and if the task is complex or involves a response that the performer has not learned well, impairment occurs (Henchy and Glass, 1968; Good, 1973). Further, these effects increase as the numbers of coactors increase.

Although this model of social facilitation has been supported experimentally (Shaw, 1976, p. 57), it has received little support outside the laboratory. Nevertheless, it does provide a framework for examining the process by which isolation may affect the performance of black faculty.

First, this model specifies the conditions under which performance may be enhanced or inhibited. Kanter (1978), for example, citing evidence obtained in a field study of "token women" from a large corporation found that isolation could lead to either overachievement or underachievement. This model would predict that the more experienced women would be overachievers while the less experienced women would be underachievers.

Second, this model provides a basis for determining the boundaries within which isolation may affect performance. According to this model, boundaries are formed by the relevance of the evaluations of those who are in the audience. And, although this definition is subjective it does provide a yardstick by which to order the boundary conditions.

Finally, this model provides a critical link between isolation and performance. It does not directly address the empirical question of whether or not minority status leads to isolation, but it is suggestive of an approach to this question. If minority status, however defined, leads to increased evaluation apprehension, then the effects of isolation on performance should be more salient.

Applied to the question of what conditions within predominantly white schools may adversely affect the productivity of black faculty, this model suggests the following. First, we can assume the evaluation apprehension of all faculty to be relatively high because an integral part of academic life is evaluation. Each faculty member is evaluated by his peers, students, the administration, and outside agencies (e.g., journal editors, funding agencies).

Second, we might expect the evaluative potential of a white audience to be greater for black faculty than that of a black audience. In predominantly white schools, it seems likely that the white audience will be perceived as capable of providing more positive or negative outcomes than the black audience. Additionally, because the nature of these positive or negative outcomes likely involve tenure and promotion, then we would expect the evaluative potential of an audience to be less as academic rank increases. However, we would also expect that as rank increases, recognition by one's peers also increases. Thus, we also assume that for black faculty in predominantly white schools, the evaluative potential of the white audience

will remain high across academic ranks.

Third, because social facilitation enhances the performances of well-learned or dominant responses while impairing the performances poorly learned or subordinate responses, we expect social facilitation to enhance performances at higher academic ranks and to impair performances at lower academic ranks. Implicitly, we assume that the nature of the faculty performance remains constant across academic ranks.

And finally, because facilitation effects increase with the size of the audience, we would expect that these effects would increase as the amount of interaction that black faculty have with their white colleagues increases. This expectation is due to the prerequisite condition that facilitation requires not the "mere presence" (Zajonc, 1965) of an audience, but rather one with an evaluative potential (i.e., one that can provide positive and negative outcomes). Because the outcomes of promotion, tenure, and recognition to a great extent reside in a faculty member's colleagues, then those colleagues are an audience with great evaluative potential. Further, although faculty colleagues do not have to interact in order to provide these outcomes, such interaction is a direct evaluation. And, Martens and Landers (1972) find that direct rather than indirect evaluation is a prerequisite for facilitation. In addition, we might also expect that the "size of the audience" would increase with academic rank. The higher the rank the more likely it is that the faculty member will occupy central roles that will necessitate interaction with greater numbers of colleagues.

Thus, on the basis of the social facilitation model we derive the following hypotheses about black faculty productivity in predominantly white schools:

(1) The greater the amount of contact with whites, the greater will be the facilitation effect.

(2) For the lower academic ranks, social facilitation will impair performance; for the upper academic ranks, social facilitation will enhance performance.

(3) As academic rank increases, social facilitation effects will increase.

(4) Social facilitation effects will not occur as a function of contact with blacks.

METHOD

Data

The data for this study were collected in 1979 as a part of a larger study of black faculty in the Northeast. Using a multistage sampling design, all non-specialized, predominantly white schools within a 50-mile radius of a major Northeastern city (e.g., Boston, Hartford, New York, Philadelphia, and Washington, D.C.), and with at least 2000 students were selected in the first stage. Then, in subsequent stages, questionnaires were mailed to all black faculty currently teaching at these 103 schools.[2] A esponse rate of 70 percent yielded 386 completed questionnaires.

Measures

The dependent variable, productivity, was based on a self-report of how many of each of several types of products the

respondent had completed.[3] Because the hypotheses under consideration here relate to amount or level of performance rather than to the quality of that performance or the professional impact of that performance, no attempt to differentially weight these products was made. However, because the distributions of products were severely skewed, a logrithmic transformation was used.[4]

The primary independent variable, contact with white colleagues, was derived from a checklist item which asked respondents to indicate, "With how many of your white colleagues in your department do you engage in each of the following activities?"[5] This item, scored 0 = none and 4 = all, was then factor analyzed. Four types of contact based on this factor analysis were then operationalized by taking the mean of the three activities with the highest loadings on each of the four factors: informal contact, formal contact, professional contact, and hostile contact.[6] A fifth contact measure, the average of the first four (with hostile contact negatively scored), white contact, was also constructed. Analogous measures of contact with black colleagues were operationalized from a similar checklist item pertaining to black colleagues.[7] However, the item for black colleagues was worded, "With how many of your black colleagues in your department and school do you engage in each of the following activities?" This change was necessitated by the accurate expectation that most black faculty do not have black colleagues in the same department. Thus, any differences in the effects for white contact and black contact may be due to differences in the proximity of the

white and black audiences.

A measure of institutional quality, a proxy for research norms and resources, was based on the Carnegie ranking of American colleges and universities (Carnegie Commission on Higher Education, 1973). The highest Carnegie ranking, Research University I, was coded 8 and the lowest rank, not listed, was coded 0. This measure was necessary because previous research has indicated the quality of an institution can affect the performance of its faculty (Cole, 1979). Also, in terms of these hypotheses, it may be that higher quality schools have "larger audiences" than lower quality schools.

In addition, because of previous research that indicated the importance of sex, marital status, and age for productivity, these variables were included in the analysis (Allison and Stewart, 1974; Reskin, 1976). Sex and marital status were dummy coded (male = 1, female = 0; not married = 0, married = 1).

These last four measures will be used as covariates in an analysis of covariance (Cohen and Cohen, 1975).

Procedure

Because considerable variation was expected as a function of academic rank, parallel analyses were performed for each of the ranks: lecturers, assistant professors, associate professors, and full professors. The analyses were conducted using multiple regression with the order of variable entry determined by the focus of the analysis. First, the demographic variables of sex, age, and marital status were entered, then institutional quality was entered, then the

contact variable, and finally the interactions of these variables with each other. This hierarchical procedure allows one to assess the effect of the last entered variable after removing or controlling for the effects of the previously entered variables. Thus, the significance tests refer to the increase in the explained variance (R^2) due to the last variable entered.

RESULTS

Table 1 presents the means and standard deviations, and Tables 2a-2e, the intercorrelations for the variables used in this analysis for the total sample and each of the academic ranks.

Insert Tables 1 and 2a-2e about here

These results confirm that substantial differences exist between the ranks and that parallel analyses are needed for each rank. In particular, note that the correlation between white contact and productivity is .02 for the total sample, while the same correlation is .44 for full professors.

The results of the regression analysis for the four academic ranks are presented in Table 3.[8] Controlling for the effects of

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Insert Table 3 about here

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sex, age, marital status, and school quality,[9] contact with whites is significantly associated with productivity for lecturers ($R^2_{(I)} = .06$), assistant professors ($R^2_{(I)} = .05$), and full professors ($R^2_{(I)} = .13$). For associate professors,

contact with whites is not significantly associated with productivity.

Further, although not hypothesized, it was possible that the covariates could moderate the effect of contact with whites, a violation of one of the assumptions of the analysis of covariance. However, for full professors, associate professors, and assistant professors, neither the two-way, nor three-way, interactions between the covariates and contact with whites were significant. For lecturers, however, both the two-way and three-way interactions were significant. This indicates that for lecturers, the analysis of covariance model is not appropriate and suggests that many different combinations of age, sex, marital status, institutional quality, and contact with whites are associated with high productivity.

It is possible that these findings are due to the ambiguous meaning that the academic rank of lecturer has. At some institutions it is used to designate those of a rank beneath instructor and at others it is used to designate some prestigious member of the non-academic community only tenuously associated with a particular educational institution. Thus, the meaning of productivity and the nature of the contact with whites that lecturers have with their colleagues may differ from that of the other academic ranks. Consequently, the finding that contact with whites increases the productivity of lecturers cannot be taken as either supporting or contradicting the hypothesis that the greater the contact with whites, the greater the social facilitation effects.

Moreover, although it was hypothesized that contact with whites would be associated with facilitation effects for all academic ranks, the failure to find such a relationship for associates would seem to have been predictable. Because the basis of social facilitation is the evaluative potential of the audience, then no facilitation should occur for those faculty for whom their colleagues provide no positive or negative outcomes. The outcomes that seem most relevant for faculty are tenure, promotion, and recognition. But, across the three academic ranks of assistant, associate, and full professor, these outcomes do not seem equally important or consistent. For assistant professors, it seems likely that tenure and promotion are maximally important while recognition is minimally important, a decreasing function. For full professors, on the other hand, recognition may be maximally important while tenure and promotion are minimally important, an increasing function. Thus, for associate professors, the evaluative potential of white colleagues may be low because they have tenure and promotion, and are not yet concerned about recognition.

These results also provide partial support for the second hypothesis: For the lower academic ranks, facilitation impairs productivity, while for the higher academic ranks, facilitation enhances productivity. For assistant professors the contact with whites beta = -.177, while for full professors the contact with whites beta = .481. (The negative beta for associate professors cannot be interpreted because the effect is not significant.)

Additionally, this finding also suggests why no facilitation effects occurred for associate professors. Because social facilitation enhances dominant responses and impairs subordinate responses, it may be that the productivity related responses of associate professors are neither dominant nor subordinate.

These data also support the third hypothesis: As academic rank increases, facilitation increases. The effect for full professors (R^2 = .16) is more than three times that for assistant professors (R^2 = .05).

In order to test the fourth hypothesis--facilitation effects occur for contact with whites, but not for contact with blacks--the variable contact with blacks was substituted in the previous regression equations. For full professors, contact with blacks was positively associated with productivity (beta = .197; R^2 = .14; $p < .05$; df = 1,21). For associate and assistant professors, contact with blacks was not significantly associated with productivity. For lecturers, contact with blacks was negatively associated with productivity (beta = -.274; R^2 = .06; $p < .05$; df = 1,33). The data only partially supported this hypothesis.

One might argue that because recognition, an important outcome for full professors, can be provided by blacks as well as whites and facilitation effects occur for contact with blacks. Alternatively, one might argue the important outcome for assistant professors is tenure and promotion, in a predominantly white institution bestowed by whites. Thus, facilitation effects

might well occur for full professors and a black audience but not for assistant professors and a black audience. However, this argument would also imply that a black audience would not be associated with facilitation effects for lecturers. But, in fact, facilitation effects occur for lecturers and a black audience. Therefore, the results can be said to only partially confirm the fourth hypothesis.

Two other questions may be raised about the support the data provide for these hypotheses. First, it is possible that contact with whites provides more than an audience effect. It is possible that contact with whites enables senior faculty to participate in professional networks that facilitate their productivity. Junior faculty on the other hand may have contact with whites for only social reasons. Thus, while contact with whites may provide senior faculty with the opportunity of professional accomplishment, it may be distracting for junior faculty.

In order to determine how the type of contact with whites affected productivity, a further analysis was performed. Because a factor analysis of the contact item had indicated four distinct types of contact -- informal, formal, professional, and hostile -- each of these specific types of contact was successively substituted for contact with whites in the regression equations previously reported in Table 3. For full professors, associate professors, and assistant professors, only informal contact with whites had a similar effect as contact with whites, albeit somewhat smaller. For lecturers, however, neither informal nor formal contact with whites had any effect

on productivity. Professional contact with whites was positively associated with productivity (beta = .347; R^2 = .12; $p < .05$; df = 1,33) while hostile contact with whites was negatively associated with productivity (beta = -.485; R^2 = .22; $p < .05$; df = 1,33). Therefore, it seems that lecturers do experience a type of contact with whites different than assistant professors or full professors. However, for the other three academic ranks it appears that the effects are limited to informal contact, a finding consistent with social facilitation. That is, professional contact with whites involves activity that would aid productivity and is thus likely to decrease arousal. Hostile contact involves no uncertainty about the outcome to be provided. And, formal contact involves an audience with whom the contact is so casual it may not be arousing.

A second question that may be raised concerns changes in the social and professional environments that the four academic ranks may experience. Because of increased competition for jobs, affirmative action, and economic decline, younger faculty may not react to contact with whites in the same way as older faculty (i.e., period effects). Moreover, the type of white faculty member may have changed or the type of black faculty member may have changed, or both (i.e., cohort effects).

Although the possibility of period effects cannot be ruled out, a partial test of the possibility of cohort effects can be made. By entering contact with blacks in the regression equation before contact with whites, it is possible to determine how much of the relationship between productivity and contact with whites is shared by contact with blacks. This shared

variance, indicated by the reduction in the association between productivity and contact with whites may be interpreted as "sociability." For full professors, associate professors, and assistant professors, controlling for contact with blacks did not affect the association between contact with whites and productivity. However, for lecturers, controlling for contact with blacks eliminated the association between contact with whites and productivity (R^2 = .00). Thus, it appears that, at least, for "sociability" only the lecturers differ from the other three academic ranks.

DISCUSSION

These data provide support for the application of a social facilitation model to the performance of black faculty and more generally to the performance of individuals who have extreme minority status.

As the amount of contact with whites increased, the productivity of black faculty was also more greatly affected, but only if the black faculty could be provided a positive or negative outcome. However, this conclusion, in part, rests upon the finding that while effects for contact with whites were found for full professors and assistant professors, no effects were found for associate professors. And, there were no hypotheses exempting associate professors from effects for contact with whites.

Moreover, no direct measures were possible of the evaluative potential of the whites with whom the black faculty did have contact. Thus, we do not know if the junior black

faculty were interacting with junior white faculty. If they were, then it is not known why that particular white audience should have an evaluative potential. Junior faculty generally do not participate in tenure and promotion decisions for other junior faculty.

This question of the evaluative potential of the white audience is also related to the finding that contact with whites impairs the performance of junior faculty and enhances the performance of senior faculty. Our interpretation of this difference was that the productivity related responses of junior faculty were subordinate responses, while those of senior faculty were dominant responses. An alternative interpretation, however, might be that junior faculty have only social contact with whites but senior faculty have more professionally related contact with whites. When the particular type of contact that was related to productivity was examined, it was found that for both junior and senior faculty only informal contact was significantly related to productivity. This finding partially supports our assumption that for these black faculty even informal contact with whites has an evaluative potential. And, this finding more strongly supports our interpretation that contact with whites for junior faculty and senior faculty does not differentially affect productivity because the type of contact is different.

Further, the effect of contact with whites on productivity was specific to whites; contact with blacks did not affect productivity. This finding also suggests that for these black faculty a white audience has evaluative potential. It should be noted, however, that any comparison of the effects of the black

audience with the white audience is confounded. The black audience was comprised of "blacks in the university," while the white audience was comprised of "whites in the department." Nevertheless, it does seem clear that the black audience had less evaluative potential.

Another question that might be raised about these results concerns the inconsistent findings for lecturers. It was assumed that they were junior faculty. However, because universities differ in how they assign the rank of lecturer and thus they are a more heterogeneous group, inconsistencies for this rank might be expected.

Finally, the most serious problem with this analysis concerns the possibility of cohort or period effects. The different ranks, because of their different mean ages, might be expected to have different backgrounds and/or different experiences. Although this question cannot be satisfactorily resolved, one test, admittedly weak, of the differences in the "sociability" of the different ranks was not significant. This does not rule out the possibility of cohort or period effects, but does suggest that they may not be a serious problem.

Despite the alternative explanations of these findings, an inherent problem of survey research, a social facilitation model of the productivity of extreme minorities does seem a viable framework for further research.

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FOOTNOTES

1. If the definition is altered to involve the minority's perception of the majority's reaction, then the more appropriate question becomes one of when the minority is more or less likely to perceive such a reaction.

2. A list of black faculty was first requested by the administration at each of these 103 schools. For schools that did not provide this list, black student organizations were contacted. If they were unable to provide a list of black faculty, then individual faculty at the remaining schools were contacted. Although this method of sampling can bias the sample, no other feasible alternative was available. This method is consistent with those used in other studies of black faculty and yielded comparable estimates of the number of black faculty. See, David Rafky, "The Black Scholar in the Academic Marketplace," Teachers College Record 75, (#2, 1972).

3. The productivity measure was the average of the self reported number of products that the respondent had completed (e.g., articles, books, technical reports, paper presentations, proposals, exhibitions, instructional materials, etc.). Although one-way analyses of variance for each type of product revealed significant differences in the number of these products completed across disciplines, a similar analysis for this composite measure revealed no significant discipline differences. Further, a one-way analysis of variance of this composite measure by academic rank revealed the expected significant differences; professors had the most products, associate professors the next highest number of products, then assistant professors, and lecturers had the least number of products.

4. The problem of a skewed distribution in the productivity of scientists is usual; the log transformation used here is the usual remedy. See, Jonathan R. Cole, Fair Science: Women in the Scientific Community (New York: Free Press, 1979).

5. Informal contact was assessed by such items as "at least once a year they visited you in your home" and "at least once a year you visit in their homes." Formal contact was assessed by items such as "at least once they have publicly expressed belief in your ability" and "at least once a week you have friendly conversations when you meet." Professional contact included such items as "at least once a year they read and critique your work" and "at least once a year you work together on research products." Hostile contact included items like "at least once a year you have heard a verbal expression of prejudice" and "at least several times a year they are reluctant to provide entitled information."

6. A principal components analysis of the 12 contact items was used with the factors extracted in the following order: informal contact, formal contact, professional contact, and hostile contact. They accounted for 35.2%, 15.5%, 10.0%, and 9.0%, respectively, of the total variance.

7. The reliabilities for these measures are as follows: informal contact with whites, .78; formal contact with whites, .79; professional contact with whites, .75; hostile contact with whites, .51; informal contact with blacks, .86; formal contact with blacks, .86; professional contact with blacks, .81; hostile contact with blacks, 0.

8. Although it is usual to present additional estimates for the results of a regression analysis (e.g., standard errors, regression coefficients, etc.), they are not relevant here because only the relative increase in the percentage of the variance explained is being interpreted.

9. Even if these covariates are not significant they were not dropped from the regression for analytical clarity.

Table 1
Means, Standard Deviations, and *ns* by Academic Rank of the Variables Used in the Analysis

VARIABLES	PROF $\bar{M}$	PROF SD	PROF N	ASSOC $\bar{M}$	ASSOC SD	ASSOC N	ASST $\bar{M}$	ASST SD	ASST N	LECT $\bar{M}$	LECT SD	LECT N
Sex	.854	.351	48	.646	.481	110	.647	.480	133	.579	.498	57
Age	49.469	7.318	49	44.877	7.934	106	39.970	7.264	132	38.140	8.913	57
Marital Status	.740	.443	50	.654	.478	107	.547	.500	128	.589	.496	56
School Quality	4.98	2.88	50	5.392	2.509	112	5.406	2.412	133	5.684	2.443	57
Contact with Whites	1.124	.348	27	.979	.367	73	.972	.355	92	.940	.319	39
• *Informal Contact with Whites*	1.936	.541	47	1.775	.601	108	1.717	.535	126	1.605	.454	54
• *Formal Contact with Whites*	2.775	.706	46	2.477	.665	107	2.532	.728	126	2.388	.551	55
• *Professional Contact with Whites*	1.848	.716	46	1.590	.516	104	1.583	.535	127	1.485	.430	55
• *Hostile Contact with Whites*	-1.716	.469	27	-1.759	.461	76	-1.809	.488	94	-1.781	.530	41
Contact with Blacks	1.163	.352	22	1.262	.355	54	1.196	.409	65	1.261	.333	22
• *Informal Contact with Blacks*	1.716	.556	47	2.003	.710	97	1.799	.824	121	1.933	.693	50
• *Formal Contact with Blacks*	2.610	.790	47	2.691	.918	96	2.721	.928	122	2.613	.863	50
• *Professional Contact with Blacks*	1.546	.583	47	1.677	.676	96	1.531	.660	120	1.680	.573	51
• *Hostile Contact with Blacks*	-1.609	.343	27	-1.527	.262	55	-1.809	.488	94	-1.606	.521	22
Productivity	.252	.184	50	.171	.140	112	.120	.010	133	.105	.140	57

Table 2a

CORRELATIONS AMONG VARIABLES FOR TOTAL SAMPLE

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Sex	—														
2. Age	-036	—													
3. Marital Status	149	147	—												
4. School Quality	-017	-131	-080	—											
5. Contact with Whites	014	243	018	-027	—										
6. Informal Contact with Whites	-093	109	-059	023	726	—									
7. Formal Contact with Whites	-048	243	-041	-100	785	459	—								
8. Professional Contact with Whites	-064	156	-017	036	683	492	423	—							
9. Hostile Contact with Whites	030	117	037	-016	544	141	338	058	—						
10. Contact with Blacks	-216	-011	-070	134	208	216	118	227	-071	—					
11. Informal Contact with Blacks	-132	-049	041	097	144	294	052	165	-094	793	—				
12. Formal Contact with Blacks	-030	054	-070	014	210	048	127	125	020	742	487	—			
13. Professional Contact with Blacks	-038	-004	050	118	092	103	-046	233	-122	747	672	447	—		
14. Hostile Contact with Blacks	-067	070	017	026	130	-081	059	060	476	043	-189	-043	-182	—	
15. Productivity	139	130	111	021	017	094	-030	121	-069	039	027	-005	107	-060	—

*p ≤ .05 **p ≤ .01

Table 2b

CORRELATIONS AMONG VARIABLES FOR LECTURERS

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Sex	—														
2. Age	002	—													
3. Marital Status	041	283	—												
4. School Quality	-067	-174	-068	—											
5. Contact with Whites	-117	423	070	-147	—										
6. Informal Contact with Whites	-114	149	036	-031	709	—									
7. Formal Contact with Whites	-095	430	-113	-007	798	397	—								
8. Professional Contact with Whites	-016	046	069	-020	626	573	301	—							
9. Hostile Contact with Whites	-181	182	028	036	408	-046	181	-191	—						
10. Contact with Blacks	-249	221	317	-184	258	114	040	-118	380	—					
11. Informal Contact with Blacks	173	014	298	-012	043	233	-103	226	-248	725	—				
12. Formal Contact with Blacks	152	146	230	-381	098	-057	015	-014	111	704	479	—			
13. Professional Contact with Blacks	229	-236	129	-180	-127	012	-181	167	-233	497	704	431	—		
14. Hostile Contact with Blacks	-190	032	-034	097	216	-266	034	-316	858	477	-070	334	-141	—	
15. Productivity	193	110	018	-329	-049	047	057	349	-483	-198	237	147	317	-737	—

*p $\leq$ .05 **p $\leq$ .01

Table 2c

CORRELATIONS AMONG VARIABLES FOR ASSISTANT PROFESSORS

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Sex	—														
2. Age	-095	—													
3. Marital Status	086	177*	—												
4. School Quality	027	-215**	-048	—											
5. Contact with Whites	-152	209*	-285**	023	—										
6. Informal Contact with Whites	-209	-073	-139	-021	680**	—									
7. Formal Contact with Whites	-165*	191*	-001	-153*	775**	459**	—								
8. Professional Contact with Whites	-239**	118	-111	123	673**	477**	358**	—							
9. Hostile Contact with Whites	062	125	-170	-011	561**	079	313**	109	—						
10. Contact with Blacks	-263*	-075	003	326**	382	233*	180	224*	045	—					
11. Informal Contact with Blacks	-232**	-118	092	162*	272**	399**	163*	202*	-033	844**	—				
12. Formal Contact with Blacks	-106	062	-113	114	389**	126	226**	173*	131	732**	433**	—			
13. Professional Contact with Blacks	-105	-053	015	165*	235*	142	-037	296**	-041	793**	688**	438**	—		
14. Hostile Contact with Blacks	059	190	-094	-072	125	-089	177	126	409**	-191	-349**	-175	-326**	—	
15. Productivity	046	-161*	022	289**	-183	-126	-184*	107	-113	074	010	-046	134	195	—

*p ≤ .05 **p ≤ .01

Table 2d

CORRELATIONS AMONG VARIABLES FOR ASSOCIATE PROFESSORS

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Sex	—														
2. Age	-283**	—													
3. Marital Status	256**	-139	—												
4. School Quality	-039	-056	-175*	—											
5. Contact with Whites	120	126	250*	010	—										
6. Informal Contact with Whites	-071	133	-136*	111	759**	—									
7. Formal Contact with Whites	052	204*	-151	029	812**	520**	—								
8. Professional Contact with Whites	004	127	-012	149	734**	530**	456**	—							
9. Hostile Contact with Whites	041	-002	255*	-021	651**	302**	527**	184	—						
10. Contact with Blacks	-219	-007	-304*	-047	088	238*	146	35[illegible]**	-372**	—					
11. Informal Contact with Blacks	-181*	-058	-236*	017	119	346**	086	328**	-114	747**	—				
12. Formal Contact with Blacks	-088	000	-13[illegible]	028	074	023	041	212*	-110	820**	634**	—			
13. Professional Contact with Blacks	-134	067	-041	087	072	143	01[illegible]	393**	-162	738**	665**	526**	—		
14. Hostile Contact with Blacks	-234*	241*	171	113	208	-096	083	116	445**	-108	-358**	-123	-155	—	
15. Productivity	072	-191*	086	081	-098	002	-071	-055	098	-005	-068	-033	-070	244*	—

*p ≤ .05 **p ≤ .01

Table 2e

CORRELATIONS AMONG VARIABLES FOR FULL PROFESSORS

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Sex	—														
2. Age	107	—													
3. Marital Status	170	128	—												
4. School Quality	-047	078	028*	—											
5. Contact with Whites	230	135	400*	-305	—										
6. Informal Contact with Whites	-075	-045	113	042	761**	—									
7. Formal Contact with Whites	-139	143	069	-241	758**	273*	—								
8. Professional Contact with Whites	-112	115	059	-209	603**	344*	497**	—							
9. Hostile Contact with Whites	210	078	243	-082	386*	091	207	-174	—						
10. Contact with Blacks	011	-017	-164	098	067	242	054	310	-440*	—					
11. Informal Contact with Blacks	122	004	200	151	-031	-045	-147	-199	-179	-784**	—				
12. Formal Contact with Blacks	153	127	-146	079	-017	-035	105	-028	-304	691**	391**	—			
13. Professional Contact with Blacks	145	206	256*	248*	062	009	016	-074	-234	829**	608**	346**	—		
14. Hostile Contact with Blacks	231	-310	301	031	062	232	-197	297	-031	425*	391*	-042	110	—	
15. Productivity	175	116	213	058	438*	334*	-067	023	085	339	109	-003	257**	172	—

*$p \leq .05$ **$p \leq .01$

Table 3
Increases in the Explained Variance, Betas, and Degrees of Freedom for Productivity by Academic Rank

VARIABLES ENTERED	LECT B	LECT R^2(I)	LECT df(I)	ASST B	ASST R^2(I)	ASST df(I)	ASSOC B	ASSOC R^2(I)	ASSOC df(I)	PROF B	PROF R^2(I)	PROF df(I)
Demographic		.05*	3,35		.03	3,84		.04	3,64		.07	3,23
Sex	.194			.026			.006			.136		
Age	.116			-.167			-.181			.078		
Marital Status	-.023			.049			.059			.180		
School Quality	-.307	.09**	4,34	.267	.07**	1,83	.084	.02	1,63	.054	.00	1,22
Contact with Whites	-.124	.06**	1,33	-.177	.05*	1,82	-.118	.04	1,62	.481	.16*	1,21
Two-way		.56**	7,26		.05	7,75		.14	7,55		.00	7,14
SxS	-2.839[a]			.378			-.246			--[b]		
SxA	-4.542[a]			-.124			-1.376			--		
SxM	.295			-.089			.444			--		
CxS	-.886[a]			.194			.427			--		
CxA	-.048			-.503			1.003			--		
CxM	1.066[a]			-.160			.004			--		
SxC	2.052[a]			-.067			-.287			--		
Three-way		.07*	3,23		.04	3,72		.01	3,52		.00	3,11
SxSxC	1.117[a]			-.040			-.791			--		
AxSxC	.812[a]			-.724			.000			--		
MxSxC	--[b]			-.660			.159			--		

* $p < .05$
** $p < .01$
[a] Betas significant, $p < .05$
[b] There were no cases for this interaction to be tested.